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SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING MARCH, 1923.

By HERBERT H. KIMBALL, In Charge, Solar Radiation Investigations.

For a description of instruments and exposures and an account of the method of obtaining and reducing the measurements, the reader is referred to this REVIEW for April, 1920, **48**:225, and a note in the issue for November, 1922, **50**:595.

From Table 1 it is seen that direct solar-radiation intensities averaged somewhat below the normal values for March at Washington, and close to normal at Madison and Lincoln. An intensity of 1.48 gram-calories per minute per centimeter square measured at Washington at noon on March 29 equals the highest intensity previously measured at that station in March.

Table 2 shows that the total solar and sky radiation Mceived on a horizontal surface averaged above the laarch normal at Madison and Lincoln, and during the rest two weeks of the month at Washington.

Skylight-polarization measurements obtained at Washington on 11 days give a mean of 56 per cent, with a maximum of 63 per cent on the 29th. These are slightly below the average values for Washington for March. At Madison the ground was covered with snow throughout the month, and no measurements were obtained.

TABLE 1.—*Solar radiation intensities during March, 1923.*

[Gram-calories per minute per square centimeter of normal surface.]

Washington, D. C.

Date.	Sun's zenith distance. 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon.
	75th meridian time.	Air mass. A. M.					P. M.				Local mean solar time.
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
March 2	3.45			0.93	1.18	1.44					3.99
3	4.75				1.01	1.28	0.89				6.02
7	3.99			0.80	1.00						3.45
8	2.74			0.71	1.09	1.43	1.07	0.89			1.96
9	2.87			0.48	0.80	1.32	1.14	1.00	0.82	0.69	2.16
12	6.27						1.07	0.90	0.72	0.58	6.76
14	4.75	0.57									3.45
17	2.74					1.13	1.41	1.09	0.84	0.74	0.67	2.62
20	1.19		0.93	1.07	1.21	1.48	1.19	0.98	0.86		1.45
21	3.63		0.73	1.02	1.21	1.44	1.26	1.04			3.63
24	3.30	0.02	0.79	0.97	1.13	1.47	1.05				2.49
26	5.16	0.54	0.66	0.79	0.98						4.57
27	4.17		0.38	0.52	0.75	1.21	1.04	0.90	0.75	0.66	4.75
29	0.91				1.23	1.50	1.13	0.90	0.69	0.60	1.52
30	3.00				1.02						3.99
31	0.91	0.98	1.06	1.21	1.34	1.52					1.45
Means		0.68	0.76	0.85	1.08	1.41	1.09	0.93	0.76	0.64	
Departures		−0.03	−0.06	−0.10	−0.07	−0.01	−0.03	±0.00	−0.03	−0.04	

[1] Extrapolated.

Madison, Wis.

March 1	3.15						1.24				4.17
2	4.37		0.87	1.03	1.03						6.27
10	2.26		1.09	1.21	1.35	1.52	1.33	1.19			3.15
14	1.60		1.04	1.19	1.37	1.58					2.16
16	1.19		1.14	1.27	1.41	1.58	1.38	1.20			1.24
19	0.51			1.28	1.43						0.79
23	1.96			1.03	1.24						2.36
24	1.19		1.11	1.22	1.34	1.46					1.24
26	1.12		1.09	1.21	1.27						1.24
27	2.87				1.38	1.60	1.36				1.80
28	0.64		1.06	1.23	1.36	1.52					0.71
30	1.32		0.92		1.29						1.24
31	0.86		1.07	1.21	1.38	1.57					1.19
Means			1.04	1.19	1.32		1.31	(1.20)			
Departures			±0.00	±0.00	±0.00		−0.01	+0.04			

TABLE 1.—*Solar radiation intensities during March, 1923*—Continued.

Lincoln, Nebr.

Date.	Sun's zenith distance. 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon.
	75th meridian time.	Air mass. A. M.					P. M.				Local mean solar time.
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
March 6	3.30		1.11	1.22	1.38						3.30
8	3.45	0.80									5.36
9	4.57			1.10	1.30	1.56					3.45
10	3.30						1.26	1.12	0.93	0.84	3.00
16	1.19		0.63	0.99	1.23		1.24	1.09	0.93	0.79	2.16
17	3.15		0.86	1.05	1.22	1.41					3.81
19	0.81		1.09	1.22	1.38						1.96
20	3.30	0.71	0.82	0.95							4.17
23	3.15		0.90		1.28						4.17
24	3.81	0.87	1.01	1.17	1.36	1.57					3.81
26	2.49						1.43	1.07	0.88	0.73	3.15
28	2.49		0.95	0.98	1.23	1.55					2.74
29	4.17				1.14	1.62					4.57
Means		0.79	0.92	1.08	1.29		1.30	1.08	0.91	0.78	
Departures		−0.07	−0.01	±0.00	±0.00		+0.03	±0.00	−0.01	±0.00	

TABLE 2.—*Solar and sky radiation received on a horizontal surface.*

Week beginning.	Average daily radiation. Washington.	Madison.	Lincoln.	Average daily departure for the week. Washington.	Madison.	Lincoln.	Excess or deficiency since first of year. Washington.	Madison.	Lincoln.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Feb. 26	205	233	362	−82	−51	+14	−2,580	−1,350	−187
Mar. 5	229	297	371	−81	−12	−2	−3,144	−1,437	−203
12	291	300	320	−46	−31	−80	−3,463	−1,651	−764
19	379	377	432	+23	+31	+15	−3,303	−1,438	−661
26	467	514	584	+93	+150	+158	−2,649	−389	+444

WEATHER OF NORTH AMERICA AND ADJACENT OCEANS.

NORTH ATLANTIC OCEAN.

By F. A. YOUNG.

The average pressure for the month was considerably below the normal at St. Johns, Newfoundland, while at land stations on the American coast, south of Nantucket, small positive departures were the rule, the same conditions holding true at stations on the south coasts of the British Isles. The pressure at Bermuda was considerably above the normal, while at the Azores it was below. The atmospheric conditions over the area between these two localities was rather abnormal during a portion of the month, when the steep gradient was responsible for turbulent weather, which in some cases was accompanied by comparatively high barometric readings. Lerwick, Shetland Islands, was within the limits of an area of high pressure that remained over northwestern Europe from the 14th to 21st, and the high pressure at that station during this period, was responsible for an unusually large positive departure from the normal for the month.

The number of days on which fog was reported was apparently slightly below the normal over the Grand Banks, while it was somewhat above along the American coast, between Hatteras and Canada. Fog was observed on from 2 to 4 days in the Gulf of Mexico, the maximum occurring in the 5-degree square between latitudes 25° and 30° N. and longitudes 90° and 95° W. The middle section of the steamer lanes was, as usual, comparatively free from fog, and it was also rare in the vicinity of the British Isles, although somewhat above the normal in the region between the 15th meridian and the French coast.

The unusually severe weather that has prevailed over the North Atlantic since September, continued in full force during March, although, taking the ocean as a whole, there was a decrease in the number of days with winds of gale force, as compared with February, although they were above the normal for March. The severest weather occurred in the region between the 40th and 45th parallels and 40th and 60th meridians, where gales were reported on from 7 to 10 days. Over that portion of the steamer lanes between the 20th and 40th meridians, the conditions were not far from normal, while the waters adjacent to the European coast were comparatively free from severe weather, due to the long period of anticyclonic conditions referred to above.

The month began with a disturbance off Hatteras, while at the same time the eastern part of the steamer